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PATENT

UNITED STATES PATENT APPLICATION

of

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for

MEDICAL PORT FOR AN EMERGENCY SAFETY RESUSCITATOR

CROSS-REFERENCE TO RELATED APPLICATION

This is a continuation-in-part of copending U. S. application serial no. 09/570,154, filed on 5/12/2000, which will issue as United States patent no. 6,276,363 and which was a continuation of U. S. application serial no. 09/193,424, filed on 11/17/98, which issued as United States patent no. 6,062,217.

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to a medical device and more particularly to a port to provide access to administer medicine or insert medical instruments into the throat of a patient while such patient is being treated with a resuscitator, *i.e.*, a manually operated device utilized to provide emergency ventilatory assistance to facilitate the breathing of a sick or injured patient.

DESCRIPTION OF THE RELATED ART

The inventor is unaware of any prior art medical device which incorporates the ability to provide endotracheally administered medications to, or insert medical instruments into the throat of, a patient .

United States patent no. 5,575,279 of Douglas K. Beplate describes an isolation valve to be used by a care giver who is blowing such care giver's own breath into the lungs of a patient. The isolation valve of that patent employs a check valve to force the breath of the patient through an exhalation filter before such breath can reach the surrounding environment.

SUMMARY OF THE INVENTION

The prior invention inserts, between a source of air or oxygen and a patient a collapsible bag and a connecting complex. A nebulizer or aerosolizer for providing medication can be attached to the connecting complex. Additionally, the connecting complex includes an aperture with a removably attached self-sealing membrane through medications can be administered with a syringe. When the self-sealing membrane has been removed, a suction catheter may be placed through the aperture.

The connecting complex can communicate with the patient either through a mask or an endotracheal tube.

A one-way valve precludes liquids or gases expelled by the patient from reaching either the point of attachment for the nebulizer and aerosolizer or the collapsible bag.

A filtered exhaust aperture permits the exhaled breath of the patient to reach the atmosphere. A carbon dioxide detector placed in the exhaust aperture indicates whether the patient is breathing.

And utilizing a filter that has both a hydrophobic segment and a hydrophilic segment minimizes that chances that a harmful microorganism that associates with liquids will enter the surrounding environment.

The present invention makes the portion of the connecting complex that includes an aperture with a removably attached self-sealing membrane through medications can be administered with a syringe available as a separate unit for connection to the collapsible bag of any resuscitator.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates the Portable Emergency Safety Resuscitator.

Figure 2 shows a carbon dioxide detector attached to the exhaust aperture of the Portable Emergency Safety Resuscitator.

Figure 3 depicts a filter having a hydrophobic segment and a hydrophilic segment that are adjacent to one another.

Figure 4 portrays a filter having a hydrophobic segment and a hydrophilic segment spaced apart from one another.

Figure 5 shows the tube used as a medical port with the collapsible bag of any resuscitator.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention can utilize a collapsible bag **1** having an inlet **2**, a major outlet **3**, and a minor outlet **4**. Attached to the major outlet **3** of the collapsible bag **1** and communicating with the interior **5** of the collapsible bag **1** is a first arm **6** of a hollow three-armed connector **7**.

A second arm **8** of the hollow three-armed connector **7** is available for attachment to a nebulizer or aerosolizer **100**. The open end **9** of the second arm **8** is preferably sized to accommodate commercially available nebulizers and aerosolizers **100**.

A first end **10** of a flexible tube **11** is attached to the minor outlet **4** of the collapsible bag **1**. A second end **12** of the flexible tube **11** may be attached to a nebulizer or aerosolizer **100**. If no nebulizer or aerosolizer **100** is employed, the second end **12** of the flexible tube **11** is attached to the open end **9** of the second arm **8** of the hollow three-armed connector **7**.

The inlet **2** of the collapsible bag **1** is available to be releasably connected to a source of air or, preferably, oxygen. When such connection has been made, oxygen can flow into the interior **5** of the collapsible bag **1**, through the collapsible bag **1**, through the major outlet **3** of the collapsible bag **1**, and into the first arm **6** of the hollow three-armed connector **7**.

Oxygen can also flow through the minor outlet **4** of the collapsible bag **1** and through the flexible tube **11**. If the flexible tube **11** has been connected to a nebulizer or aerosolizer **100**, the oxygen will then enter the nebulizer or aerosolizer **100** and carry medication from such nebulizer or aerosolizer **100** into the second arm **8** of the hollow three-armed connector **7**. If no nebulizer or aerosolizer **100** has been attached to the open end **9** of the second arm **8** of the hollow three-armed connector **7**, the flexible tube **11** is attached to a first end **13** of a hollow adapter **14**; and a second end **15** of the hollow adapter **14** is connected to the second arm **8** of the hollow three-armed connector **7**. Oxygen can then flow from the flexible tube **11**, through the hollow adapter **14**, and into the second arm **8** of the hollow three-armed connector **7**.

Preferably, the major outlet **3** and the minor outlet **4** are of such sizes that the flow of oxygen through the major outlet **3** is 17 liters per minute; and the flow of oxygen through the minor outlet **4** is 8 liters per minute when the collapsible bag **1** is receiving oxygen at a typical rate of flow from a source of oxygen. Also, the collapsible bag **1** may be squeezed by a care giver to vary the rate of flow of oxygen.

Attached to and communicating with a third arm **16** of the hollow three-armed connector **7** is a first end **17** of a housing **18** containing one-way valve **19** to permit air, oxygen, and medication to flow toward the patient but to preclude the transmission of liquids or gases flowing from the patient.

Preferably, the housing **18** also contains, between the one-way valve **19** and the second end **20** of the housing **18**, an exhaust aperture **21** through which the exhaled breath of the patient can reach the atmosphere. Also preferably, a filter **22** covers the exhaust aperture **21** to minimize the possibility that contaminants from the patient will enter the atmosphere.

And the hollow three-armed connector **7** is preferably T-shaped.

Attached to and communicating with a second end **20** of the housing **18** is a first aperture **23** of a tube **24**. The tube **24** is preferably L-shaped. And the hollow three-armed connector **7**, the housing **18**, and the tube **24** are preferably constructed of rigid clear plastic.

A second aperture **25** of the tube **24** is releasably covered by a self-sealing membrane **26**. The self-sealing membrane is preferably siliconized.

To a third aperture **27** of the tube **24** may be connected either a mask or an endotracheal tube.

When the endotracheal tube is employed, the needle of a syringe can be inserted through the self-sealing membrane **26**, through the second aperture **25**, through the tube **24**, through the third aperture **27**, and into the endotracheal tube so that medications can be pushed from the syringe into the endotracheal tube for the patient.

Alternatively, when the self-sealing membrane **26** has been removed from the second aperture **25** of the tube **24**, a suction catheter may be inserted through the second aperture **25**, through the tube **24**, through the third aperture **27**, and through the endotracheal tube to remove fluids such as blood, emesis, and secretions from the patient's airway in order to permit the patient to breathe.

Preferably, first ends **28** of strips of flexible plastic **29** are attached to the inside **30** of the tube **24** between the first aperture **23** and the second aperture **25**. The second ends **31** of the strips of flexible plastic **29** push against one another so that when a suction catheter is inserted, a seal is formed between the inside **30** of the tube **24** and the suction catheter to preclude contamination from the patient escaping into the atmosphere. The location of the strips of

flexible plastic **29** prevents their interfering with the flow of oxygen from the first aperture **23** to the third aperture **27**.

The present invention, furthermore, makes the tube **24** available as a separate unit to attach directly to and communicate with the collapsible bag **1** of any resuscitator. A hollow adapter **37** has a first end **38** that attaches to and communicates with the outlet **39** of the collapsible bag **1** and a second end **40** which attaches to the tube **24** around the first aperture **23**. Preferably, the hollow adapter **37** is constructed of rigid clear plastic.

Optionally, as illustrated in Figure 2, a carbon dioxide detector **32** is inserted into the exhaust aperture **21**. The carbon dioxide detector **32**, of course, indicates, in any manner that is well known in the art, the presence of carbon dioxide, which shows that the patient is breathing.

The carbon dioxide detector **32** is so constructed as not significantly to impair the flow of the exhaled air and can optionally contain its own filter, which, for clarity, is designated the detector filter **33**.

Preferably, the filter **22** and the detector filter **33** consist, as shown in Figure 3, of a first segment **34** that is hydrophobic and a second segment **35** that is hydrophilic in order to retard the passage of moisture, which frequently contains harmful microorganisms. The first segment **34** and the second segment **35** can be adjacent to one another, as depicted in Figure 3, or can have a space **36** between each other, as shown in Figure 4. And, also, preferably, the first segment **34** is installed nearer to the patient than is the second segment **35**.